# SOCIAL AWARENESS AND ROLE INNOVATION IN ENGINEERS*

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Introduction

In 1921, Veblen predicted the emergence of a technocracy, with the engineer becoming the guardian of the community's material welfare, guiding the nation through responsible economic planning (Veblen, 1922). As Perrucci and Gerstl note however, the engineer's contribution to society thus far has not been one of a revolutionary force based on an expanded sense of social responsibility (Perrucci & Gerstl, 1969). In part this reflects the pattern of employment that has predominated among engineers over the last half century since Veblen. Typically engineers are salaried employees of large organizations involved in research and/or production. Organization goals generally preclude and often conflict with any engineers' personal involvement in social issues. The sense of autonomy necessary for individual engineers to challenge organizational prerogatives, while a characteristic of "professionals" in general (Moore, 1970), is not a "socialized" norm of the engineering profession and as such is not typical of contemporary engineers (Kornhauser, 1963).

Today however, the increasing trend toward environmental, political, and social concerns cannot leave any one profession untouched. Student activism in these areas is not restricted to liberal arts campuses (note M.I.T.) (Miner, 1971). Thus we assume that the effects of "social awareness", as seen in the activities of the public interest lawyers such as Ralph Nader, the advocacy architects, and the new doctors in social medicine, will also be felt in the science and engineering professions.

Theoretical Development

Schein has developed the concept "Role Innovation" to describe some of the changes in the professions that we have already witnessed and of which we expect to see more (Schein, 1971). Role Innovation represents a rejection of the norms which govern the practice of a profession combined with a concern for the role of the professional in society. There are two elements of the concept that are important to note here. The first is that role innovators are defined as changing the practice of professions, rather than the core content or subject matter of a profession. Role innovators in architecture for example are not necessarily creating new design concepts, but they are redefining the appropriate client system to work with, stressing the needs of the ultimate user of a building (e.g. a low income family), rather than the real estate developer who hired them (O'Hare, 1968). The second important point is that the role innovator, in redefining professional norms, has an underlying concern with making the profession more relevant to the pressing problems of society.

Schein indicates various dimensions along which role innovation can occur. A role innovator can redefine (a) who is a legitimate client; (b) who initiates the contact between client and practitioner; (c) what is an appropriate setting for conducting professional practice; and (d) what are the legitimate boundaries of the professional's areas of expertise. The sources of role innovation can be found in both the individual and the social structures that surround him. Schein identifies

several phenomena that can act independently or together to stimulate role innovation: 1) environmental changes can result in new problems (or new perceptions of old problems) that call for new solutions (e.g. health care for urban ghettos); 2) professionals with different values and attitudes may enter the ranks of the profession attempting to modify professional norms to better match their orientation; and 3) professionals with different cognitive styles may likewise enter the profession and attempt to change "the way of doing things" so as to permit greater congruity between job requirements and personal style (Plovnick, 1971). Role innovators thus create new professional role models which may complement or replace older ones.

The role innovation model can be applied to William Evan's predictions for the engineering profession (Evan, 1969). Evan suggests some potential social roles for future engineers. For that segment of the profession characterized by low-quality training he sees a "de-professionalizing" process whereby they will tend to coalesce with engineering technicians. At the high quality end of the spectrum, engineers will begin to merge with applied scientists. The majority of engineers, in the middle of the spectrum, will continue to perform high quality technical engineering work but will be motivated (by themselves and society) to enhance their social role in either of two directions. One would be toward the acquisition of power at organizational or national levels as a means of guarding the community's welfare( a la Veblen). The second

would be to move towards being a more professionally self-conscious engineer concerned with the economic and social as well as technological development of society. Note that both of Evan's new engineering models fit the role innovation definition in that the technical content of the role remains constant (high quality technical engineering) while the social role changes as a result of concern for societal problems. Evan suggests that the technocrat role is more likely in elitist, non-democratic societies while the "professional technologist" role is more congruent with democratic anti-elitist cultural norms, such as in the United States.

Schein and Evan predict changes in the engineering profession that would have great impact on the profession and on the society it serves. It is important then that we know more about the potential changes and changers. If change is in the wind, then we might assume that some evidence of role innovation already exists in the profession and can be studied. Based on Schein's and Evan's discussions we would predict that there exist among practicing engineers many who are distinctly concerned about the social impact of their work, and are dissatisfied with the current state of their profession and job, and are inclined towards a more "professional" role for themselves.

The goal of social responsibility is often inconsistent with the goals of the organizations employing engineers, and thus creates a conflict between the organizationally prescribed engineering role and that defined by a socially aware engineer. Since role conflict is a source of job

dissatisfaction (Kahn, et.al., 1964), we would expect socially responsible engineers to be dissatisfied with their jobs. Current "professional" norms for engineers provide little support for a socially concerned engineer since they do not stress "service to society" and "autonomy" (to challenge organizational directives) but rather "absolution of responsibility" (Merton, 1957) and "obedience" (Evan, 1969). Thus the socially responsible engineer should be dissatisfied with the current state of his profession. However, since "service to society" and "autonomy" are important indicators of professionalism in general (Moore, 1970), and since stronger professional associations provide the surest means of enforcing norms of social responsibility on the profession (Evan, 1969), the socially aware engineer should be inclined toward more professional role involvement, and a strengthening of the engineering profession.

## The Study

The remainder of this paper will describe a study of 370 engineering graduates of the Massachusetts Institute of Technology. The purpose of this study was to identify a group of potential role innovators and to investigate some of their attitudes and characteristics to determine whether the trends predicted above are occuring. The subjects were part of a larger study of all M.I.T. alumni who had graduated in 1951, 1955, and 1959. Our sample of 370, questioned in 1970, consisted only of engineering (as opposed to scientists) technologists (as opposed to managers).

Several of the questions in the Alumni Survey were relevant to the issues discussed. Awareness of and concern for social issues, a key characteristic in our definition of role innovators, was determined by summing the answers to two questions selected from a series of questions requiring respondents to indicate the importance to them of various job characteristics, on a 1 (low) to 5 (high) scale.

"Work that is relevant to social problems."

"Job which allows me to make a contribution to society."

Mean scores for these questions were 2.41 and 3.01 respectively (see Table 1). A total score of 7 or greater was arbitrarily determined as indicating high social awareness. It is interesting to note that the mean scores for the two socially relevant job characteristics were considerably lower than the means for the other twenty items in the index which averaged 3.82 (see Appendix for other items).

Table 1. Percentage Distribution of Responses to Social Awareness Questions

| | | Work Relevant to Social Problem | | | | | |
|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | |
| Job Allows Contribution to Society | 1 | 14 | 0.8 | 0 | 0 | 0 | 14 |
| | 2 | 6.5 | 9.5 | 0.8 | 0.3 | 0 | 17 |
| | 3 | 6.5 | 9 | 14 | 2.5 | 0 | 32 |
| | 4 | 2.8 | 3.5 | 9.4 | 10.2 | 0 | 26 |
| | 5 | 0.6 | 0.3 | 2.8 | 3.4 | 3.1 | 10 |
| | | 30 | 23 | 26.5 | 16.5 | 3.1 | 100% |

N=268

High social awareness was the first criterion for selecting our group of role innovators. Our first prediction was that socially aware engineers would be dissatisfied with job and profession. Two questions were used to determine these attitudes, on 1 to 5 scales.

"How satisfied are you with your present job?"

"People vary in the extent to which they are in agreement with the main trends of their profession. Please indicate where you place yourself (on a scale of agreement).

Answers of 4, 5 were considered satisfied, or agreeing. Answers 1, 2 or 3 were dissatisfied or disagreeing. Tables 2 and 3 indicate the frequencies of agreement and satisfaction for high and low socially aware engineers.

Table 2. Percent of Engineers with Different Levels of Social Awareness who Agree or Disagree with the Profession

| | | Agreement | | |
|---|---|---|---|---|
| | | Lo | Hi | |
| Social Awareness | Lo Soc | 48 | 52 | 100% N=151 |
| | Hi Soc | 60 | 40 | 100% N=70 |

$x^2 = 2.70$; Significant at $p = .10$

Table 3. Percent of Engineers with Different Levels of Social Awareness who are Satisfied or Dissatisfied with their Job

| | | Satisfaction | | |
|---|---|---|---|---|
| | | Lo | Hi | |
| Social Awareness | Lo Soc | 45 | 55 | 100% N=151 |
| | Hi Soc | 48 | 52 | 100% N=70 |

(Not Significant)

Table 2 indicates that socially aware engineers are in somewhat less agreement with trends in engineering than non-socially aware engineers. Table 3 indicates only a very slight trend in the predicted direction.

It is possible that low job satisfaction, rather than social awareness could be the source of disagreement with the profession. In order to discover what interactive effects, if any, were occuring between agreement and satisfaction we held satisfaction constant and then checked the relation between social awareness and agreement. (see Table 4).

Table 4. Percent of Engineers with Different Levels of Social Awareness and Job Satisfaction who Agree with the Profession

| | | Satisfaction | | | |
|---|---|---|---|---|---|
| | | Lo | | Hi | |
| Social Awareness | Lo Soc | 54 | (N=68) | 49 | (N=83) |
| | Hi Soc | 32 | (N=36) | 47 | (N=34) |

The results indicate that disagreement is found most frequently among engineers who are both socially aware and dissatisfied with their jobs. Frequency of disagreement is somewhat greater for engineers with high job satisfaction under conditions of low social awareness. It is the same for high and low social awareness under conditions of high job satisfaction. In one sense this result is heartening since it discounts claims that disagreement is strictly a dissonance reaction to not liking

one's job. What it might suggest is that socially aware engineers who indicate high job satisfaction may have "socially relevant" jobs and therefore may see the profession more positively than those socially concerned engineers with less satisfactory jobs from which to view the profession. Some support for this hypothesis was found, although the N's are small, when we discovered that those engineers who indicated high social awareness and high job satisfaction are relatively more common in non-profit institutions (as opposed to private industry and government) when compared to socially aware, dissatisfied engineers. Non-profit institutions are generally seen as granting engineers more autonomy in proposing and selecting projects. Thus, they may allow for more congruity between an employee's social values and his work, hence greater job satisfaction and agreement with profession.

The next prediction deals with change. Evan suggested that the socially aware engineers would be inclined towards a more professional image of themselves as part of the process of redefining the professional and social role of the engineer. Thus we would expect that they would identify more closely with professional societies. However, this hypothesis assumes that attitudes of social relevance necessarily lead to a desire for a changing role model which then leads to professional identification. The intervening variable is an inclination towards a changing role. Thus we must first determine whether social relevance attitudes are in fact associated with a desire for a changing professional role. While we did not explicitly ask a question relating to this

relationship there were two questions that touched on the issue. One measured what we might call a preference for stability or predictability of role. Respondents indicated their role preferences with respect to the following choice:

1. To work at the core of a well established field or profession.
2. To work at the frontiers of a well established field or profession.
3. To work in an emergent, more nebulous, or rapidly changing field or profession.

The trend from "core of profession" to "new field" is one of increasing ambiguity which we assume is associated with a greater inclination towards unstable or changing roles. Computing frequencies of high and low socially aware engineers with this variable yielded the following:

Table 5. Percent of Engineers with Different Levels of Social Awareness who are Inclined towards Ambiguous Roles

| | | Role Ambiguity Inclination | | | |
|---|---|---|---|---|---|
| | | 1 | 2 | 3 | |
| Social Awareness | Lo Soc | 14 | 50 | 36 | 100% N=176 |
| | Hi Soc | 5 | 45 | 50 | 100% N=80 |

$x^2 = 6.55$; Significant at $p = .04$

The results support our predictions in that there is an inclination toward more ambiguous roles among engineers with high social awareness.

Defining Role Innovators

The 5% of socially aware engineers who prefer core roles do not seem to meet the criterion of non-resistance to changing role models which would be necessary to develop the professional self consciousness necessary for role innovation. Thus we refine our socially aware group by eliminating these 5% and redefined the group as "Role Innovators." Actually, these are potential role innovators and are defined in this study as engineers with high social awareness and a willingness for ambiguous, changing roles.

Defined this way we would expect the Role Innovators to demonstrate a more professional orientation, since our theory presumes that stronger professional associations provide the means of enforcing new norms of social responsibility for engineers. Our five questions dealing with professional identification are:

1. Do you presently belong to a professional society?
2. Have you ever read a paper at a professional society meeting?
3. Have you ever published any professional articles, papers, or books?
4. I am more concerned with how my work looks to my professional colleagues than to my boss.
5. If there are conflicts between professional standards and the interests of my employer I tend to resolve them in favor of my employer. (reverse scoring).

"Yes" and "no" answers were recorded for each question. (see Table 6).

Table 6. Percent of Role Innovators and Others Indicating Positive Professional Identification

| | Role Innovators | Others | Significance |
|---|---|---|---|
| 1. Belong Society | 70 | 69 | Not Significant |
| 2. Read a Paper | 45 | 35 | $x^2 = 2.15$ Significant at p=.15 |
| 3. Published | 53 | 40 | $x^2 = 3.85$ Significant at p=.05 |
| 4. Colleagues Over Boss | 39 | 29 | $x^2 = 2.51$ Significant at p=.12 |
| 5. Profession Over Employer | 69 | 55 | $x^2 = 3.89$ Significant at p=.05 |
| N's | 76 | 180 | |

Professionalism

The results indicate reasonable differences in the predicted directions for items 2, 3, 4, and 5, and no difference for item 1. Item 5 is of particular importance in this analysis since it is at the core of the social concern/organizational concern conflict, and it achieves the most significant differences. These results support the predicted relationship between professionalism and role innovation. This is particularly interesting in view of the negative attitudes of Role Innovators (see Table 7) towards current professional norms, which should actually lead to less professional identification unless some other dynamic, such as the desire to change the professional role model, is also affecting these engineers.

Table 7. Percent of Role Innovators and Others who Agree or Disagree With the Profession

| | Agree | Disagree | |
|---|---|---|---|
| Role Innovators | 38 | 62 | 100% N=101 |
| Others | 53 | 47 | 100% N=220 |

$x^2 = 3.83$; Significant at $p = .05$

We have defined a group of potential role innovators, characterized by a high degree of social awareness and an inclination towards more ambiguous professional roles for themselves. These role innovators express some dissatisfaction with their current jobs in engineering, and disagreement with the norms of the engineering profession. Yet these role innovators indicate more of a professional orientation then their peers, especially with respect to conflicts between professional ethical standards and organizational interests. In the following analyses we will examine some further characteristics of role innovators relating to their age, education, abilities and performance.

## Other Characteristics of Role Innovators

It was possible that only the younger engineers, fresher out of school and less entrenched in their jobs might be more socially aware, and more role innovative. This was not however the case when we com-

puted frequencies of role innovators by graduating class. (see Table 8). These results indicate a pervasiveness to the role innovation phenomenon.

Table 8. Percent of Role Innovators and Others in Each Graduating Class

| | Graduating Class | | |
|---|---|---|---|
| | 1951 | 1955 | 1959 |
| Role Innovators | 31 | 31 | 30 |
| Others | 69 | 69 | 70 |
| | 100% N=100 | 100% N=58 | 100% N=98 |

(Not Significant)

There were some differences in the level of education of role innovators. That is there were proportionately a few more Masters and Doctorates among Role Innovators than non-Role Innovators. This result supports the prediction of greater professionalism of Role Innovators (Table 6) and suggests that socialization in graduate school may be a source of values leading to role innovation.

Table 9. Percent of Role Innovators and Others Having Graduate Degrees

| | Graduate Degree | | | | |
|---|---|---|---|---|---|
| | BS | BS+ | MS | PhD | |
| Role Innovators | 32 | 8 | 45 | 16 | 100% N=76 |
| Others | 33 | 16 | 41 | 11 | 100% N=180 |

(Not Significant)

Is there any actual proof that Role Innovators are attempting new roles? Respondents rated their satisfaction from:

> "Activities directed at community, national, or international betterment."

This category was rated by respondents as a significant (first, second, or third most satisfying), or an insignificant part of their lives when compared to job, family, leisure time, and non-work creative activities.

Table 10. Percent of Role Innovators and Others Valuing Social Betterment Activities

| | Social Betterment Ranking | | | | |
|---|---|---|---|---|---|
| | First | Second | Third | Not Rated | |
| Role Innovators | 7 | 5 | 15 | 73 | 100% N=76 |
| Others | 1 | 3 | 11 | 85 | 100% N=179 |

$x^2 = 8.02$; Significant at $p = .05$

Role Innovators show a somewhat more pronounced inclination towards a role model which includes activities of social betterment. Proportionately more than twice as many Role Innovators prefer social betterment activities as do non-Role Innovators.

## Assessment of Role Innovators

To discover more about what kind of engineers Role Innovators were we analyzed questions relating to self-assessment, success ratings, and salaries. Self-Assessment ratings consist of four factors constructed by averaging answers on a 0-4 scale for the following questions.

| Factors | Questions |
|---|---|
| A. Openness | 1. Overall breadth of perspective, vision. |
| | 2. Ability to continue to learn new things. |
| | 3. Positive attitude toward further education. |
| B. Cognitive Ability | 1. Ability to identify problems. |
| | 2. Ability to analyze and solve problems. |
| | 3. Ability to do research. |
| | 4. Ability to think creatively. |
| C. Influence | 1. Ability to induce change in organizations. |
| | 2. Leadership ability. |
| | 3. Leadership desire. |
| D. People-Orientation | 1. Tolerance of other people and their points of view. |
| | 2. Ability to work with other people. |
| | 3. Willingness to be influenced by others. |

Perceived Success ratings are made by the respondent himself on a 1-5 scale, while Salary Income ratings represent another measure of success and are measured by ranges of reported income. Tables 11, 12, and 13 contain the results.

Table 11. Mean Self-Assessment of Role Innovators and Others

| Assessment Factors | Role Innovators | Others | |
|---|---|---|---|
| Cognitive Ability | 3.07 | 2.89 | t=2.25 Significant at p=.015 |
| Openness | 2.95 | 2.79 | t=2.0 Significant at p=.02 |
| Influence | 2.66 | 2.43 | t=2.0 Significant at p=.02 |
| People-Relations | 2.98 | 2.80 | t=2.2 Significant at p=.015 |
| | N=71 | N=172 | N=243 |

Table 12. Percent of Role Innovators and Others and their Levels of Perceived Success

| | Success Low 1 | 2 | 3 | 4 | High 5 | |
|---|---|---|---|---|---|---|
| Role Innovators | 2 | 12 | 40 | 35 | 10 | 100% N=76 |
| Others | 0 | 9 | 38 | 43 | 10 | 100% N=178 |

(Not Significant)

Table 13. Percent of Role Innovators and Others and their Levels of Income

| | Salary Levels Low $0-15,000 | Medium $15-20,000 | High $20-30,000 | |
|---|---|---|---|---|
| Role Innovators | 23 | 45 | 32 | 100% N=72 |
| Others | 21 | 55 | 24 | 100% N=174 |

$x^2 = 3.15$; Significant at p = .20

On the four self-assessment questions Role Innovators were superior. On the perceived success measure Role Innovators scored slightly lower while on the salary measure they scored somewhat higher. The results seem to indicate that Role Innovators earn more (and presumably achieve more) than other engineers yet see themselves as being less successful, yet more competent. Perhaps they are more productive and competent, but are constrained by their ethical conflicts with their employers (see Table 4) from fully exploiting their resources. This is a hypothesis for which we have no direct evidence in this survey.

There are some interesting theoretical sidelights to the results on the self-assessment questions. Certain schools of thought on career development place heavy emphasis on self-image as the key variable in determining career patterns, and personal development as well (Super, 1957, Tiedeman, 1963). Interaction with the environment results in feedback to the self, or differentiations, that must be synthesized or reintegrated into a consistent self-image. Given a differentiation, or an inconsistency between self and environment, persons with a higher self-assessment would be more inclined towards seeing the need for change in the environment, as opposed to the reaction of a low-self assessment person who might accept the differentiation as confirmation of his low self-image. As role innovation represents an individual's taking action on the environment, we would expect role innovators to have higher self-assessment than non-role innovators, as ours do.

The specific factors identified in the self-assessment question support the above analysis. Influence and Cognitive Ability relate to feelings of efficacy in dealing with the environment, while Openness and People-Orientation reflect feelings of security in assimilating environmental inputs. Looking further into these factors provides an opportunity to explore a proposition introduced earlier. It was suggested that people with cognitive styles different than those commonly found in an occupation can be a source of role innovation. Previous research has shown that qualities of divergent thinking ability may account for role innovation in convergent fields such as the physical sciences and engineering (Plovnick, 1971). Divergent thinking is associated with openness to new ideas or patterns of thought. Again the Openness and People-Orientation factors reveal that this divergent quality is stronger among our role innovators. Two of the items in the Cognitive Ability factor provide further data to analyze the relation between cognition and our role innovators. Qualities of problem identification have been associated with divergence, while problem analysis and solution are more the deductive domain of convergers. Analyzing the two questions measuring these perceived qualities among our sample (see Cognitive Ability factor) revealed that our role innovators did seem to have more of an advantage in problem identification ability than in problem analysis and solution ability when compared to non role-innovators (see Table 14). "High skills" are determined by a response of (4) on the 1-4 scale measuring the skills.

Table 14. Percent of Role Innovators and Others Claiming High Cognitive Skills

| | Skills | | |
|---|---|---|---|
| | Problem Identification | Problem Analysis and Solution | |
| Role Innovators | 51 | 44 | N=76 |
| Others | 36 | 33 | N=178 |

Table 14 indicates that the differences between Role Innovators and non-Role Innovators claiming high skills are greater for problem identification than for problem analysis and solution. Role Innovators then have more of an advantage in divergent qualities than convergent qualities, and may thus be considered divergent thinkers when compared to their colleagues. This relation between a divergent thinking bias and role innovation in a technical field is consistent with previous research findings. These results support the hypothesis that cognitive style, like attitudes, values, and societal demands, can be a source of role innovation.

## Conclusions and Implications

Utilizing Schein's concept of Role Innovation this paper has investigated some predicted, emerging phenomena within a group of engineers. The purpose was twofold. One goal was to operationalize the role inno-

vation concept and to apply it to a real situation to demonstrate its utility. The other goal was to better understand some changes that were occuring in a professional group of great interest and importance.

With respect to the second goal, the data collected seemed to support the predicted trends among engineers. Although the results cannot be used to determine the direction of causality, we discovered significant relationships leading us to believe that there are many engineers who are concerned about the societal impact of their work, who are not content with current professional practice yet adhere to unusally high professional and ethical standards, who are already involved in non-work activities directed at community betterment and who do not seem averse to a changing professional role, which could include more socially relevant activities.

The role innovation concept in general proposes that changes in the professional's environment, or in the professional himself, can lead to attempts at changing some of the profession's norms of practice. Our engineering sample provides evidence for the existence of potential role innovators in engineering. The implications for organizations employing engineers is clear. Some of the more talented and productive engineers now and in the future will experience considerable dissatisfaction in their jobs unless they are able to engage in work oriented more towards "social relevance". This dissatisfaction can cause high turnover and can lead to increased difficulty for the organizations in recruiting new talent.

The implication for engineering and the professions in general is that change from within the ranks is probable. If professions respond to these change efforts by resisting them, then much energy will be expended unproductively (Bucher & Strauss, 1961). Schein suggests instead that the professions stimulate and encourage these innovations so as to meet the needs of the profession and of the society more effectively. The principal stimulators of innovation described by Schein are the educational and training institutions of young professionals. To counteract the forces of tradition in the professions, these training institutions need to instill strong values of flexibility, adaptability and innovation in their students. To accomplish this Schein suggests professional education be characterized by 1) interdisciplinary faculties; 2) education in the underlying disciplines of fields in addition to training in applications; 3) training in skills for working with people and intervening in complex social systems; and 4) providing mechanisms for helping to manage the careers of students after they graduate and enter the profession. (Schein, 1971).

While we are fairly secure, in general, of our predictions of change in the professions, and of the need for encouraging innovation, we are less sure of our ability to specifically identify and measure the mechanisms by which these changes occur. This speaks to our other goal in undertaking this study. As is the case with other theories in the area of carrer development, we need to be more explicit about our concepts. We need to further specify our definition of role innovators and the psychological processes involved in role innovation. Specifically, a next study could develop concepts

and hypotheses for which more direct means of measurement could be employed. The secondary analysis employed in this study utilized survey questions that were not originally designed to investigate the variables discussed in this paper. A next study could develop instruments specifically relevant to an investigation of role innovation. Interviews, observation, and detailed questionnaires applied cross-sectionally or longitudinally could provide valid and reliable data about role innovation. While this study has taken only a small step in operationalizing some of the concepts involved, it will hopefully stimulate further interest and inquiry into role innovation, a subject of both theoretical and practical importance.

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APPENDIX

| Job Characteristics | Mean* |
|---|---|
| Reasonable workload | 3.35 |
| Opportunity for advancement | 4.00 |
| Department where people are friendly and congenial | 3.74 |
| Challenging work to do | 4.48 |
| Work from which I could get a personal sense of accomplishment | 4.60 |
| Highly regarded organization | 3.25 |
| Recognition for doing a good job | 4.17 |
| Job which allows me to make a real contribution to the success of the organization | 4.07 |
| Good physical working conditions | 3.12 |
| Training or educational opportunities (to improve my knowledge or skills) | 3.25 |
| Efficiently run department | 3.43 |
| Considerable freedom to adopt my own approach to the job--to be creative and original | 4.25 |
| Job regarded highly by others in the company--a job with some prestige | 3.25 |
| Good fringe benefits | 3.12 |
| Job which leaves sufficient time for family and personal life | 3.83 |
| Work that is relevant to social problems | 2.41 |
| Job security (steady work) | 3.53 |
| Opportunity for high earnings | 3.79 |
| Location | 3.67 |
| Opportunity to exercise leadership | 3.60 |
| Job which allows me to make a contribution to society | 3.01 |
| Opportunity to work with people rather than with things | 2.75 |

*Based on 1 (low) to 5 (high) scale of importance to individual.